residential local loop service, given the ILEC's market penetration and generally high quality service.[103]

Furthermore, where WLL service is offered, it will not necessarily be structured as a replacement service to wired loop. It is more likely, for a number of reasons, that WLL service will be positioned as a complementary or supplementary service to wired local loop. As a replacement service, WLL is open to a number of competitive issues. Being a replacement is more expensive due to higher expectations for service quality than for mobile service or supplementary local loop service. Being a replacement also requires clearing a higher hurdle in terms of services provided.

The profit margins for WLL in the U.S. are not tremendous. In addition, flat-rate pricing is sensitive to unexpected cost spikes, such as higher than anticipated acquisition costs, or higher than expected local calling usage. Acquisition costs can inflate if CIU installation costs are more than expected, or subsequent technician visits are required. Higher than expected levels of local calling usage create additional traffic-sensitive costs (radio channel equipment, back-haul and switching) which are difficult to recover in a flat-rate pricing environment. Given an environment with no long-term operating history, new technology, and no significant pent-up demand, it is unlikely that many PCS carriers will "bet the bank" on WLL service.

With certain exceptions, CMRS carriers have not been regulated much by state regulatory bodies. With the passage of the 1996 Act, CMRS carriers seem to have even less of a

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[103] Currently, 93 percent of United States households have ILEC based telephone service. See, FCC Trends in Telephone Service, *supra.*, note 56.

chance of being regulated by state utilities commissions.[104] However, filing to compete in the residential local loop market could certainly invite a much higher level of state regulation. States could impose such requirements as: an obligation to provide service to all who request it; a requirement of some form of low-cost lifeline service; and/or a requirement to provide service into areas that, for economic reasons, would not otherwise attract PCS service provider attention (e.g. remote rural areas). For the right to provide service with marginal profitability, a CMRS carrier could be saddled with economically unacceptable regulatory burdens.

Individually or in combination, the difficulty in attaining ILEC service levels, a flat-rate pricing structure coupled with variable costs, and the potential of added state regulatory burden, may be enough to keep some potential WLL service providers on the sidelines.

2. ILEC Responses To WLL Service Providers

The ILECs themselves would not likely be passive; it is unlikely they would allow a significant incursion into their former monopoly market to go unanswered. What is likely is that ILEC responses would be swift and varied. There is little to prevent current ILECs from offering a WLL product. Spectrum can be acquired by auction, or partnering with an auction winner, or even partitioning an auction winner's license. The ILEC's installed base of switching, feeder and distribution facilities, brand name recognition, and current subscriber relationships would all provide advantages to the ILEC in offering a WLL service that a start-up competitor would find difficult to overcome.

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[104] There is an ongoing FCC proceeding that is determining the regulation of fixed services (such as WLL) for CMRS. See, Amendment of the Commission's Rules To Permit Flexible Service Offerings in the Commercial Mobile Radio Services, Further Notice of Proposed Rulemaking, WT Docket No. 96-6, released August 1, 1996.

The ILECs are also in a position to effectively market against WLL on two key service related issues. First, the nature of WLL service, specifically the need to contend for a radio channel to access switching (in effect competing for dial tone), makes the reliability of WLL vulnerable to negative ILEC advertising. Over the years the ILECs have made service, as symbolized by providing reliable dial tone, a commodity that is taken very much for granted by their customers. The ILECs would likely be very quick to seize on any quality shortcomings of WLL service as a promotional tool to use against their competitors.

The second key service issue is also coupled with the concept of reliable, worry-free service. In this country, most telephone users are well versed to dial 911 in an emergency with the expectation that the public service agency answering the call will know the caller's phone number and, in many cases, the address from which they are calling. Cellular and PCS network 911 capability is an issue the FCC has addressed, but is five years away from resolving.

As it currently stands, it will be the year 2001 before there is any requirement that any specific caller location data will be forwarded by the carrier to the public service answering point. The recent FCC Report and Order concerning wireless services and E911, mandates that by 2001 only 67 percent of CMRS calls be located within 125 meters.[105] Location within 125 meters is better than no location at all, but practically speaking it can be of limited value to emergency response units. In many cities 125 meters can be across a freeway or river, in an adjacent large multi-story dwelling, or in any one of a dozen townhouses. Between 1997 and 2001, all that is required is to identify the cell the call is coming from, which could cover an area

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[105] Revision of the Commission's Rules To Ensure Compatibility with Enhanced 911 Emergency Calling Systems, CC Docket No. 94-102, R&O and FNPRM released July 26, 1996.

in excess of 50 square miles. While the use of a CIU would eventually eliminate this issue, clearly there is concern here for personal and family safety which wireline ILECs could use against WLL service, especially if the WLL service was being considered as a replacement for wired service.

3. WLL In the Marketplace

Given the unresolved issues surrounding WLL service in the United States, the question to ask is, will it be available at all? The answer is almost assuredly "yes." There are reasons PCS Carriers may elect to offer some form of WLL. First, there may be a marketing advantage in being able to offer a bundle of services that includes WLL. The expectation is not that the WLL service will be tremendously lucrative, but that the ability to offer a bundle of services will attract more high-margin mobility users than otherwise, and thereby increase revenues overall.

There are also certain niche markets that may make use of the service. Most of these uses will relegate WLL to a "second line" status, an alternative means of access to the PSTN. It should be noted that second line growth in the United States has been very active in the last few years, and is expected to continue a strong growth pattern.[106] Over and above the traditional needs for a second line (e.g., teenagers), there are a number of new imperatives driving the demand for additional residential local exchange access. Perhaps the most cited of these are the growth of home offices and telecommuting, coupled with increased usage of modems and facsimile machines, and access to the Internet.

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[106] See, MTA-EMCI, *supra.*, note 52.

PCS may not be the most appropriate choice if data communications is the driving factor in acquiring additional access. Current dial-up wired loop data rates on average exceed PCS technology rates (28.8 kbps vs. 14.4 kbps), and though wireless speeds will eventually match current POTS dial-up, the advent of cable modems and ILEC broadband access (using Digital Subscriber Line technologies) will raise the bar and make PCS technology-based wireless data access very inefficient.

The driver to choosing wireless local loop access will be demand for a certain level of mobility. Be it merely the desire for a neighborhood cordless phone, or a second home line for business calls, mobility needs will motivate the selection of wireless. For instance, as the growing popularity of pagers for teenagers has shown, parents are looking for ways to keep track of their kids. A PCS phone could keep the household's main phone line clear and, at the same time, provide a means of reaching wandering offspring. In this case a CIU might not be needed, which makes it a more attractive proposition for the PCS carrier -- showing once again the cost of being a replacement is much higher than being a supplement.

Still, there are niches that could be served by PCS as a replacement for wired loop. An example is college students and younger working people who want their own private and consistent phone service. They may find it problematic in the wired loop environment due to roommate situations or frequent relocation of living quarters. A PCS phone with voice mail would provide a continuity of service that would give the subscriber a constant ability to be reached despite a new address or roommates monopolizing the phone.

Thus, while most PCS carriers will not aggressively market WLL as a wireline substitute in the near term, where it is eventually deployed WLL will generally be a complementary means

of access, used as a second line -- bundled with mobility service. Only small niche segments will use PCS as primary access (e.g., college students, solo professionals, or for temporary service pending the installation of wired facilities).

In sum, the PCS-based WLL technology modeled here cannot be relied upon to provide significant competition to ILECs in the near term. And, as discussed above, PCS was the most likely choice among existing technologies to provide viable ILEC competition. Alternative approaches such as the announced AT&T system may provide greater long-term hope for ILEC competition. However, the key phrase is "long-term." As noted above, the technology is, for practical purposes, still on the drawing board. While the ultimate result may be different, at best the AT&T alternative occupies the same ground as cable telephony some three or four years ago. It would be a mistake to base public policy decisions regarding ILEC regulation on such a promise

VIII. CONCLUSION

This paper has conducted an empirical assessment of the likelihood that cable telephony and wireless technology will provide significant competition for ILEC residential services. The business cases for cable telephony and WLL are not optimistic even with conservative assumptions regarding network development costs, operating costs, market penetration and revenue growth. Positive IRRs for cable occur only when 10-year penetration is assumed to reach 20 percent. The WLL IRRs are lower than the cable telephony IRRs.

These findings do not mean that local competition from cable and wireless operators will never materialize. Cable companies may deploy telephony in certain cases. If they are successful, more widespread deployment will occur. As discussed above, even wireless

operators may deploy wireless loop service under the right set of circumstances, although the wireless services modeled here are likely to remain more of a complement than a substitute for existing local telephone services.

What the results of this study do show is that significant local competition is not "right around the corner." The implications for public policy are significant. Given the already weak case for local residential competition, it is essential that pro-competitive public policy measures are implemented as soon as possible and are vigorously enforced. Policies premised on the inevitability of local competition are destined to fail. Allowing BOCs to enter the long distance market and deregulation of ILEC prices would be premature at this stage in the development of local competition.

At the time *ELB I* was published, the results were in conflict with the optimistic press releases and newspaper reports regarding local competition. As this is written, the press reports about local competition are extremely negative. The correct conclusion is likely somewhere in the middle. Significant local competition may well develop, but pro-competitive public policy, as well as a substantial amount of time, are necessary.

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Hatfield Associates, Inc. (HAI) is an interdisciplinary consulting and research firm serving a wide range of clients in the telecommunications field. The firm was founded in February, 1982. In the more than one decade of its existence, the firm has provided consulting and educational services in nearly all aspects of the present and future telecommunications infrastructure, including local exchange networks, cable television systems, competitive access services, land mobile and personal communications, long haul terrestrial and satellite communications, data communications, and customer premises equipment.

Principals of the firm include consultants with graduate degrees and decades of senior level experience in engineering, economics, business, and policy/regulation. HAI's services include, among others, regulatory filings and policy studies, engineering studies, expert testimony, market research, economic studies, "due diligence" support, business planning, education and system development.

Examples of recent consulting assignments include:

- Modeling the cost of providing local telephone service;
- Analyzing the potential for competitive entry into the local exchange telecommunications business, presented in a paper entitled "The Enduring Local Bottleneck: Monopoly Power and the Local Exchange Carriers";
- Testifying in several state proceedings on various aspects of competitive entry into local exchange and exchange access services;
- Assessing the technological and economic merits of various telephone companies' plans for offering video dialtone services;
- Authoring the "Telecommunications Technology" and "Utility Applications of Telecommunications" chapters, describing utility opportunities in telecommunications, of a major telecommunications report for the Electric Power Research Institute;
- Developing material on telecommunications technology for inclusion in a report on international telecommunications prepared by the Office of Technology Assessment of the U.S. Congress; and
- Telecommunications education in Central and Eastern Europe.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

ORIGINAL

In the Matter of	)	
	)	
Application of BellSouth Corporation,	)	CC Docket No. 97-231
BellSouth Telecommunications, Inc.	)	
and BellSouth Long Distance, Inc.	)	
for Provision of In-Region, InterLATA	)	
Services in Louisiana	)	

Exhibit K:
LCUG and MCI Service Quality Measurements

LOCAL COMPETITION USERS GROUP (LCUG)

SERVICE QUALITY MEASUREMENTS (SQM)

September 26th, 1997
Membership: AT&T, Sprint, MCI, LCI, WorldCom

Version 6.1

Service Quality Measurements
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Service Quality Measurements
Introduction

Background:

On August 8, 1996, the Federal Communications Commission released its First Report and Order (the Order) in CC Docket No. 96-98 (Implementation of the Local Competition Provisions of the Telecommunications Act of 1996). The Order establishes regulations to implement the requirements of the Telecommunications Act of 1996. Those regulations are intended to enable potential competitive local exchange carriers (CLECs) to enter and compete in the local telecommunications markets. One requirement found to be "absolutely necessary" and "essential" to successful entry is that the incumbent local exchange carriers (ILECs) provide nondiscriminatory access to their operations support systems (OSSs). Many variations of interim OSS GUIs (graphic user interfaces), and electronic gateways have been or are being offered by the ILECs. These interim systems have not provided the capability for the CLECs to provide the same customer experience for their customer as compared to what the ILECs do for theirs. The timeliness and accuracy of information processed by the ILEC for pre-ordering, ordering and provisioning, maintenance and repair, unbundled elements, and billing have not, to date, been satisfactory. The service delivery problems exist regardless whether total service resale or unbundled elements are utilized. Final solutions for application-to-application real time system interfaces are evasive because of the complexity, the diversity of committed implementation schedules and lack or inconsistent use of industry guidelines.

On February 12, 1997 the Local Competition Users Group (LCUG) issued their "Foundation For Local Competition: Operations Support Systems Requirements For Network Platform and Total Services Resale. The core principles contained in the document are: Service Parity, Performance Measurement, Electronic Interfaces, Systems Integrity Notification of Change, and Standards Adherence. Each of these are significant to ensure CLEC customers can receive at least equal levels of service to those the ILEC provides to its own customers. The LCUG group indicated that is was essential that a plan be developed to measure the ILECs performances for all the essential OSS categories (e.g. pre-ordering, ordering and provisioning, maintenance and repair, network performance, unbundled elements, operator services and directory assistance, system performance, service center availability and billing). To that end, an LCUG sub-committee was formed with a charter to address measurements and metrics. The subcommittee jointly developed a comprehensive list of potential measurements which was developed and shared among the team members for review. Each committee member researched an assigned measurement group for the purpose of proposing consolidation and other modifications. The subcommittee discussed each measurement and considered existing regulatory requirements (minimum service standards) as well as good business practices in arriving at the recommended measurement and extent of detail to be reported. The service quality measurement (SQM) goals, or benchmark levels of performance, were established to provide a nondiscrimination standard in the absence of directly comparative ILEC results. Establishing precise benchmark level was difficult because the ILECs have been reluctant to share actual results. The goals, therefore, were based upon best of class and/an assessment of the necessary performance to support a meaningful opportunity for CLECs to compete. The SQM goals may change if the ILECs share historical and/or self report current results.

Measurement Plans:

A measurement plan, capable of monitoring for discriminatory behavior, must incorporate at least the following characteristics; 1) it permits direct comparisons of the CLEC and CLEC industry experience to that of the ILEC though recognized statistical procedures, 2) it accounts for potential performance variations due to differences in service and activity mix, 3) it measures not only retail services but experiences with UNEs and OSS interfaces, and 4) it produces results which demonstrate the nondiscriminatory access to OSS functionality is being delivered across all interfaces and a broad range of resold services and unbundled elements. The measures employed must address availability, timeliness of execution, and accuracy of execution.

Service Quality Measurements
Introduction

It is essential that the CLECs be able to determine that they are receiving at least equal treatment to that ILECs provide to their own retail operations or their local service affiliates. Benchmarks and performance standards that are voluntarily adopted by the CLECs and ILECs, or ordered by commissions, need to clearly demonstrate that new service providers are receiving nondiscriminatory treatment.

This document discusses measurements at both a summary level (Executive Overview) and at a level suitable for starting the implementation process (Measurement Detail)

Service Quality Measurements
Business Rules

Test for Parity:

ILEC Reports Results For Own Local Operations:

Both the average (mean) result and the variance of the measurement result for the ILEC and the CLEC should be compared to establish that the CLEC result is no worse than the ILEC's result.

ILEC Results Are Not Reported Or Results Are Incomplete:

The mean result for CLEC must be compared and a determination made that the CLEC result is no worse than the benchmark performance level. The benchmark performance to be employed in the comparison is the result produced via special study by an ILEC (as described below) or, in the absence of such a study result, the LCUG default performance benchmarks.

Benchmarking Study Requirements:

A special study may be optionally utilized by the ILEC to establish the benchmark performance level whenever a reasonable ILEC retail analog does not exist. When the ILEC performs a benchmarking study, it must be based upon equivalent experiences of that ILEC and conform to the following minimum requirements: (1) a benchmark result is provided for each reporting dimension described for the measurement; (2) the mean, standard error, and number of sample points are disclosed for each benchmark result; (3) the study process and benchmark results may be subjected to independent audit; (4) update to the benchmark result will be submitted whenever changes may reasonably be expected to impact the study results or six months has elapsed since the conduct of the prior study, whichever occurs earlier. Unless directly ordered by the appropriate regulatory commission, no ILEC benchmark will be utilized in lieu of an LCUG benchmark without mutual agreement of the CLECs impacted by use of the benchmark

Reporting Expectations and Report Format:

CLEC results for the report month are to be shown in comparison to the ILEC result for the same period with an indication, for each measurement result, where the CLEC result is lesser in quality compared to the ILEC (based upon the test for parity described in the preceding). Such detailed results will be reported only to the CLEC unless written permission is provided to do otherwise. Furthermore, reporting to the individual CLECs should include, for each measure, a representation of the dispersion around the average (mean) of the measured results for the reporting period (e.g. percent of 1-4 lines installed in the 1st day, 2nd day, 3rd day, and > 10 days, etc.) In addition to providing the preceding detailed results, the ILEC must also supply, to each interested CLEC, a report showing the ILEC performance for each measure in comparison to both CLEC industry in aggregate and the performance delivered to any affiliate(s) of the ILEC.

Delivery of Reports and Data:

Reports are to be made available to CLEC by the 5th scheduled business day following the close of the calendar report month. If requested by the CLEC, data files of raw data are to be transmitted by the ILEC to the CLEC on the 5th scheduled business day pursuant to mutually acceptable format, protocol and transmission media.

Geographic Reporting:

Measurement data should be reported on a natural geographic area that allows prudent operational management decisions to be made and does not obscure actual performance levels. Presently ILECs report at levels as discrete as indiviual exchanges (Central Office) to as aggregated as the Region level. The recommended default level of reporting is the MSA although further detail should be required where it improves the ability to make meaningful comparisons..

Verification and Auditing:

By joint request of more than one CLEC, an audit of the data collecting, computing and reporting processes must be permitted by the ILEC. The ILEC must also permit an individual CLEC to audit or examine its own results pursuant to terms no more restrictive than those established between the CLEC and the ILEC in the interconnection agreement for the operating area underlying the reported results.

During implementation of the measurement reporting, validation of results of data collection, measurement result computation and report production will be necessary. The ILEC must permit such validation activities and not subsequently contend that an individual CLEC has undertaken an audit either under the terms of the measurement plan or pursuant to the terms of the CLEC's interconnection agreement.

Adaptation:

Technology, market conditions and industry guidelines/standard continue to evolve. LCUG reserves the right to modify the content of this document, adding, deleting or making modification, as necessary to reflect such changes.

Service Quality Measurements
Executive Overview

This Executive Overview section:

- Provides a summary of the detailed requirements
- Enables a quick overview and understanding of the proposed LCUG measurements
- Summarizes the Business Implications associated with each measurement
- Accommodates a target audiences who have a need to know about the measurements but not the specific details

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Service Quality Measurements
Executive Overview

Pre-Ordering (PO)

Function:	
Average Response Interval for Pre-Ordering Information	
Business Implications:	
• The CLEC customer service agent must establish such basic facts as availability of desired features, likely service delivery intervals, the telephone number to be assigned and the validity of the street address while the customer (or potential customer) is on the phone • It is critical that the CLEC be perceived as equally competent, knowledgeable and fast as an ILEC customer service agent • This measure is designed to monitor the time required for CLECs to obtain the pre-ordering information necessary to establish and modify service • Comparison to the ILEC results allow conclusions whether an equal opportunity exists for the CLEC to deliver a comparable customer experience (compared to the ILEC) when a retail customer calls the CLEC with a service inquiry	
Measurements:	**Results Detail:**
• Average Response Interval for Pre-Ordering Information	• Major Pre-ordering Query Type

Ordering and Provisioning (OP)

Function:	
Order Completion Intervals	
Business Implications:	
• When the CLEC commits to a due date for service delivery, the customer plans for service availability at that point and will be dissatisfied if the requested service or feature is not delivered when promised • The "average completion interval" measure monitors the time required by the ILEC to deliver integrated and operable service components requested by a CLEC, regardless of whether services resale or unbundled network elements are employed • When the service delivery interval of the ILEC is measured for comparable services, then conclusion can be drawn regarding whether or not CLECs have a reasonable opportunity to compete for customers • The "average completion interval" and "percent completed on time" may prove useful in detecting developing capacity issues	
Measurements:	**Results Detail:**
• Mean Completion Interval • Percent Orders Completed on Time	• By Major Service Family and Order Type

Service Quality Measurements
Executive Overview

Function:	
Order Accuracy	
Business Implications:	
• Customers expect that their service provider will deliver precisely the service ordered and all the features specified • This measurement monitors the accuracy of the provisioning work performed by the ILEC in response to CLEC orders	
Measurements:	**Results Detail:**
• Percent Order Accuracy	• By Major Service Family

Function:	
Order Status	
Business Implications:	
• When a customers calls their service providers, they expect to be able to promptly get the information regarding the progress on their order(s) • When changes must be made, such as to the expected delivery date, customers expect that they will be immediately notified so that they may modify their own plans • The order status measurements monitor, when compared to the ILEC result, that the CLEC has timely access to order progress information so that the customer may be updated or notified, early on, when changes and rescheduling are necessary	
Measurements:	**Results Detail:**
• Mean Reject Interval • Mean FOC Interval • Mean Jeopardy Interval • Mean Completion Interval • Percent Jeopardies Returned	• By Status Type and Order Type

Function:	
Held Orders	
Business Implications:	
• Customers expect that work will be completed when promised • There must be assurances that the average period that CLEC orders are held, due to a delayed completion, is no worse for the CLEC when compared to ILEC orders	
Measurements:	**Results Detail:**
• Mean Held Order Interval • Percent Orders Held ≥ 90 Days • Percent Orders Held ≥ 15 Days	• By Major Service Family and Reason for Hold

Service Quality Measurements
Executive Overview

Maintenance and Repair (MR)

Function:	
Time To Restore	
Business Implications:	
• Customers expect prompt restoral of service to the normal operating parameters whenever troubles are detected • The longer the time required to correct a service problem, the greater the customer dissatisfaction	
Measurements:	**Results Detail:**
• Mean Time to Restore	• By Major Service Family and Trouble Type

Function:	
Frequency of Repeat Troubles	
Business Implications:	
• This measurement, when gathered for both the ILEC and CLEC can establish whether or not CLECs are competitively disadvantaged (vis-à-vis the ILEC) as a result of experiencing more frequent occurrence of customer troubles not being resolved in the first attempt to repair the trouble • Differences in this measure may indicate that the CLEC is receiving inferior maintenance support in the initial resolution of troubles or, in the alternative, it may indicate that the network components supplied are of inferior quality	
Measurements:	**Results Detail:**
• Repeat Trouble Rate	• By Major Service Family and Trouble Type

Function:	
Frequency of Troubles (Troubles per 100 Lines)	
Business Implications:	
• Customers demand high quality service performance from their supplier and differentials in performance are quickly recognized throughout the market place • When measured for both the ILEC and CLEC and compared, this measure can be used to establish that CLECs are not competitively disadvantaged, compared to ILEC, as a result of experiencing more frequent incidents of trouble reports • Disparity in this measure may indicate differences in the underlying quality of the network components supplied	
Measurements:	**Results Detail:**
• Trouble Rate	• By Major Service Family and Trouble Type

Service Quality Measurements
Executive Overview

Function:	
Estimated Time To Restore Met	
Business Implications:	
• When customers experience trouble on working services, they naturally expect the services to be restored within the time frame promised • When this measure is collected for the ILEC and CLEC and then compared, it can be used to establish that CLECs are receiving equally reliable (as compared to the ILEC operations) estimates of the time required to complete service repairs	
Measurements:	**Results Detail:**
• Percentage of Customer Troubles Resolved Within Estimate	• By Major Service Family and Trouble Type

Service Quality Measurements
Executive Overview

General (GE)

Function:	
Systems Availability	
Business Implications:	
• Access to essential business functionality, supported by OSS of the ILEC, is absolutely essential to CLEC operations • This measure monitors that such OSS functionality is at least as accessible to the CLEC as to the ILEC	
Measurements:	**Results Detail:**
• Percent System Availability	• By Function Interface

Function:	
Center Responsiveness	
Business Implications:	
• When CLECs experience operational problems dealing with ILEC processes or interfaces, prompt support by the ILEC is required in order to assure that the CLEC customers are not adversely impacted • Any delay in responding to CLEC center requests for support (e.g., request for a vanity telephone number) will, in turn, adversely impact the CLEC retail customer who may be holding on-line with the CLEC customer service agent • This measure, when gathered for both the CLEC and ILEC, supports monitoring that ILEC handling of support calls from CLECs is at least as responsive as for calls by ILEC retail customers seeking assistance (e.g., calling the business office of the ILEC or call the ILEC to report service repair issues)	
Measurements:	**Results Detail:**
• Mean Time to Answer Calls • Call Abandonment Rate	• By Support Center Provided

Service Quality Measurements
Executive Overview

Billing (BI)

Function:	
Timeliness Of Billing Record Delivery	
Business Implications:	
• Regardless whether the billing is for retail customer or exchange access service, the timing of ILEC delivery of billing records must provide CLECs with the opportunity to deliver timely bills in as timely a manner as the ILEC; otherwise artificial competitive advantage would be realized by the ILEC	
Measurements:	**Results Detail:**
• Mean Time to Provide Recorded Usage Records • Mean Time to Deliver Invoices	• By Type of Usage (End User Direct Bill, End User Alternately Billed, or Access) or By Type of Invoice (TSR or UNE)

Function:	
Accuracy of Billing Records	
Business Implications:	
• The accuracy of billing records affects the accuracy of the billing ultimately delivered to local service customers, whether retail service or exchange access service customers • Billing for the elements from which CLEC services are constructed must be validated to assure that only correct charges are paid	
Measurements:	**Results Detail:**
• Percent Invoice Accuracy • Percent Usage Accuracy	• By Type of Usage (End User Direct Bill, End User Alternately Billed, or Access) or By Type of Invoice (TSR or UNE)

Service Quality Measurements
Executive Overview
Operator Services and Directory Assistance (OS, DA)

Function:	
Speed To Answer	
Business Implications:	
• In order to assure that an unjustified competitive advantage is not created for the ILEC, the speed of answer delivered to CLEC retail customers, when the ILEC provides Operator Services or Directory Services on behalf of the CLEC, must be no slower than the speed of answer that the ILEC delivers to its own retail customers of equivalent local services	
Measurements:	**Results Detail:**
• Mean Time to Answer	• Operator Services and Directory Service Separately Reported Detailed, for eeach Service by Machine and Human Answer Time

Service Quality Measurements
Executive Overview
Network Performance (NP)

Function:	
Network Performance Parity	
Business Implications:	
• The perceived quality of CLEC retail services, particularly when either ILEC services are resold or UNE combinations are employed, will be heavily influenced by the underlying quality of the ILEC network performance • Customers experience the quality of the service provider each time services are used	
Measurements:	**Results Detail:**
• Network Performance Parity	• Transmission Quality • Speed Of Connection • Reliability

Service Quality Measurements
Executive Overview
Interconnect / Unbundled Elements and Combos (IUE)

Function:	
Availability of Network Elements	
Business Implications:	
• Because CLECs use individual elements as well as element combinations to deliver unique services, it is essential that the UNE functionality operate properly due to the crucial role played by such elements in providing quality retail services • This measure monitors individual network element or element combinations, that do not have an apparent retail analog, to assure that CLECs have a meaningful opportunity to compete through access to and use of element (or combination) functionality	
Measurements:	**Results Detail:**
• Availability of Network Elements	• By Unique UNE or UNE Combination employed (e.g., A-Link, D-Link, SCPs/Databases, SCPs/Databases Correctly Updated, Loop Combo Availability)

Function:	
Performance of Network Elements	
Business Implications:	
• As CLECs use individual elements (as well as element combinations) to deliver unique services, it is essential that the UNE functionality operates in a timely manner because of the crucial role played by such elements in providing quality retail services	
Measurements:	**Results Detail:**
• Timeliness of Element Performance	• By Unique UNE or UNE Combination employed (e.g.,LIDB Query time out)